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10/722,991	11/26/2003	Scott Mordin Hoyte	141441	9017

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EXAMINER	
LE, TOAN M	
ART UNIT	PAPER NUMBER
2863	

DATE MAILED: 04/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/722,991	Applicant(s) HOYTE, SCOTT MORDIN	
	Examiner Toan M. Le	Art Unit 2863	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *12-14* is/are allowed.

6)☒ Claim(s) *1,3-11,15-18,20-23,25 and 26* is/are rejected.

7)☒ Claim(s) *2,19 and 24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 November 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/26/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3-11, 15-18, 20-23, and 25-26 are rejected under 35 U.S.C. 102(e) as being anticipated by Slates (U.S. Patent No. 6,850,077).

Referring to claim 1, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target, said method comprising:

populating a data structure with data points that are relative to a predetermined target property (figure 16, Block of "provide a database of normalized impedance curves for different target materials");

determining a complex impedance value of the transducer relative to a plurality of selected data structure data points (figure 16, Blocks of "measure an impedance of a probe located proximate a target material being identified", "normalized the probe impedance", and "compare the normalized probe impedance with at least one value or curve in the database of curves"; col. 31, lines 11-14); and

determining at least one of a target material property and the gap based on an interpolation of the plurality of selected data structure data points relative to the complex impedance value (figure 16, Block of "based on the comparison, correlate the normalized probe

impedance to at least one curve in the database of curves for identifying the target material"; col. 31, lines 25-44; col. 31 to col. 32, lines 60-67 to 1-12).

As to claim 3, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein populating a data structure with data points that are relative to a predetermined target property comprises populating the data structure with data that corresponds to a complex impedance value of the transducer (col. 34, lines 40-61).

Referring to claim 4, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein populating a data structure with data points that are relative to a predetermined target property comprises populating the data structure with data points that define a plurality of curves (col. 34, lines 40-61; figures 15, 17, 18, and 20).

As to claim 5, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein the data structure data points define a plurality of curves and wherein determining the complex impedance value of the transducer relative to a plurality of selected data structure data points comprises:

selecting a first data point that lies on a first of the plurality of curves (figure 18);

selecting a second data point that lies on a second of the plurality of curves, such that the complex impedance value lies between the first of the plurality of curves and the second of the plurality of curves (figure 18); and

interpolating between the first data point and the second data point to determine the complex impedance value of the transducer (figure 18; col. 34, lines 40-61).

Referring to claim 6, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein interpolating between the first data point

and the second data point comprises interpolating between the first data point and the second data point using linear projection (figure 18, col. 34, lines 40-61).

As to claim 7, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein the data structure data points define a plurality of curves and wherein determining the complex impedance value of the transducer relative to a plurality of selected data structure data points comprises:

selecting at least one first data point that lies on at least one of the plurality of curves (figure 18);

selecting at least one other data point that lies on at least one other of the plurality of curves wherein the at least one other curve is different than the at least one curve (figure 18); and

interpolating between the selected data points to determine the complex impedance value of the transducer (figure 18; col. 34, lines 40-61).

Referring to claim 8, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein the data structure data points define a plurality of curves and wherein determining the complex impedance value of the transducer relative to a plurality of selected data structure data points comprises:

selecting a first data point and a second data point that lie on a first of the plurality of curves (figure 18);

selecting a third data point and a fourth data point that lie on a second of the plurality of curves wherein the second curve is different than the first curve (figure 18); and

interpolating between the first data point, second data point, third data point, and fourth data point to determine the complex impedance value of the transducer (figure 18; col. 34, lines 40-61).

As to claim 9, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein the complex impedance value is a data point that is bounded by line segments connecting adjacent ones of the first data point, second data point, third data point, and fourth data point and wherein interpolating between the first data point, second data point, third data point, and fourth data point to determine the complex impedance value of the transducer comprises using linear projection (figure 18).

Referring to claim 10, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein using linear projection comprises determining an intersection line for each line segment that is normal to the line segment and includes the complex impedance value data point (figures 18 and 20).

As to claim 11, Slates disclose a method of determining a gap defined between an eddy current proximity transducer and a target wherein populating a data structure with data points that are relative to a predetermined target property comprises populating the data structure with data points that correspond to a plurality of transducer excitation frequencies (col. 31, lines 45-49).

Referring to claim 15, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target, said system comprising:

a memory 120 (figure 1) comprising a data structure with data points that are relative to a predetermined target property (figure 16, Block of "provide a database of normalized impedance curves for different target materials"); and

a processor 110 (figure 1) configured to:

control execution of instructions to determine a complex impedance value of the transducer relative to a plurality of selected data structure data points (figure 16, Blocks of "measure an impedance of a probe located proximate a target material being identified", "normalized the probe impedance", and "compare the normalized probe impedance with at least one value or curve in the database of curves"; col. 31, lines 11-14); and

control execution of instructions to determine at least one of a target material property and the gap based on an interpolation of the plurality of selected data structure data points (figure 16, Block of "based on the comparison, correlate the normalized probe impedance to at least one curve in the database of curves for identifying the target material"; col. 31, lines 25-44; col. 31 to col. 32, lines 60-67 to 1-12).

As to claim 16, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target wherein said processor is further configured to control execution of instructions to populate a data structure with data points that are relative to a predetermined target property (figure 16, Block of "provide a database of normalized impedance curves for different target materials").

Referring to claim 17, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target wherein said processor is further configured to control execution of instructions to determine a complex

impedance value of the transducer relative to a plurality of selected data structure data points (figure 16, Blocks of "measure an impedance of a probe located proximate a target material being identified", "normalized the probe impedance", and "compare the normalized probe impedance with at least one value or curve in the database of curves"; col. 31, lines 11-14).

As to claim 18, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target wherein said processor is further configured to control execution of instructions to determine at least one of a target material property and the gap based on an interpolation of the plurality of selected data structure data points relative to the complex impedance value (figure 16, Block of "based on the comparison, correlate the normalized probe impedance to at least one curve in the database of curves for identifying the target material"; col. 31, lines 25-44; col. 31 to col. 32, lines 60-67 to 1-12).

Referring to claim 20, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target wherein said data structure comprises data points that correspond to a complex impedance value of the transducer (figure 16, Blocks of "measure an impedance of a probe located proximate a target material being identified", "normalized the probe impedance", and "compare the normalized probe impedance with at least one value or curve in the database of curves").

As to claim 21, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target wherein said data structure comprises data points that define a plurality of curves, said processor further configured to:

select at least one first data point that lies on at least one of the plurality of curves (figure 18);

select at least one other data point that lies on at least one other of the plurality of curves wherein the at least one other curve is different than the at least one curve (figure 18); and

interpolate between the selected data points to determine the complex impedance value of the transducer (figure 18; col. 34, lines 40-61).

Referring to claim 22, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target wherein the complex impedance value is a data point that is bounded by line segments connecting adjacent ones of said selected data points, said processor further configured to interpolate between using linear projection (figure 18).

As to claim 23, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target that is substantially insensitive to variations in the target material properties (col. 34, lines 35-39; col. 34-35, lines 62-67 to 1-11).

Referring to claim 25, Slates discloses a method incorporated into a system for determining a gap defined between an eddy current proximity transducer and a target that is configured to determine the target material type and gap substantially simultaneously for a plurality of material properties (col. 31-32, lines 60-67 to 1-24).

As to claim 26, Slates discloses a system for determining a gap defined between an eddy current proximity transducer and a target, said system comprising:

a network comprising said transducer serially coupled to an electrical component (figure 7);

a signal generator circuit 70 (figure 3) operatively coupled to said network, said signal generator circuit configured to drive a current that includes a plurality of frequency components through said network wherein a first analog voltage is impressed across said network and a second analog voltage is impressed across said transducer (col. 3-4, lines 60-67 to 1-7; col. 21, lines 26-52);

a sampling 90 and digitizing 110 (figure 3) circuit coupled to said signal generator circuit, said sampling and digitizing circuit configured to convert the first analog multi-frequency voltage impressed across said network and said second analog multi-frequency voltage impressed across said transducer into a plurality of digitized voltages (col. 4, lines 22-40);

a convolution circuit 100 (figure 3) comprising an input terminal corresponding to at least one of the plurality of component frequencies, said convolution circuit configured to convolve each digitized voltage with a digital waveform for forming a first complex number and a second complex number correlative to the first analog voltage and the second analog voltage respectively for at least one of the component frequencies (col. 4, lines 41-47);

a memory 120 (figure 3) comprising a data structure with data points that are relative to a predetermined target property; and

a processor 110 (figure 3) configured to:

control execution of instructions to determine a complex impedance value of the transducer relative to a plurality of selected data structure data points (figure 16, Blocks of "measure an impedance of a probe located proximate a target material being identified",

"normalized the probe impedance", and "compare the normalized probe impedance with at least one value or curve in the database of curves"; col. 31, lines 11-14); and

determine at least one of a target material property and the gap based on an interpolation of the plurality of selected data structure data points using linear projection (figure 16, Block of "based on the comparison, correlate the normalized probe impedance to at least one curve in the database of curves for identifying the target material"; col. 31, lines 25-44; col. 31 to col. 32, lines 60-67 to 1-12; figure 18).

Claims 2, 19, and 24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The primary reason for allowance of the claims 2 and 19 is the inclusion of the step of populating a data structure with data points that are relative to at least one of a target material composition and a target surface treatment.

The primary reason for allowance of the claim 24 is the inclusion of substantially insensitive to variations in target chrome coating.

Allowable Subject Matter

Claims 12-14 are allowable.

The primary reason for allowance of the claims 12-24 is the inclusion of the steps of populating a data structure with data points that are relative to at least one of a target material composition, a target surface treatment with a target conductivity and permeability corresponding to a complex impedance value of the transducer in determining a target material

property and a gap based on an interpolation of the plurality of selected data structure data points.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan M. Le whose telephone number is (571) 272-2276. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Toan Le

April 12, 2005

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